Summary

In stream flow frequency analysis, a flood event is mainly characterized by peak flow, volume and duration. These three variables of flood are random in nature and mutually correlated. In this study, a methodology is developed to derive bivariate joint distributions of the flood characteristics using the concept of copula considering a set of parametric marginal distributions for peak discharge (Q), corresponding Hydrograph Volume (V) and Hydrograph Duration (D) to model the correlated nature among them. A set of parametric distribution, method of maximum likelihood estimation (MLE) are used to obtain the marginal distribution for peak flow (Q), Hydrograph Volume (V) and Hydrograph Duration (D). In flood frequency analysis, the marginal distributions of peak flow (Q), Hydrograph volume (V) and Hydrograph Duration (D) are assumed to follow some parametric distribution. The concept of copula eases the restriction of flood frequency analysis by selecting marginals from different families of probability distribution functions for flood characteristics. This present work performs a better selection of marginal distribution functions for flood characteristics by parametric, estimation procedures, and reveals how the concept of copula may be used for establishing joint distribution function with mixed marginal distributions.